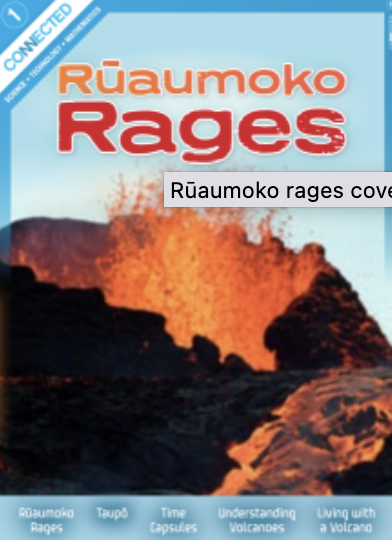
**Connected Summaries**

For each story, the pdf, a PowerPoint & teacher notes are available online but If you wish to order a paper copy ring 0800 660 662 & quote the item no.

Connected 2011

**Level 1: Rūaumoko Rages**

The focus in this issue of Connected is on the Planet earth and beyond strand of the curriculum.



[**Living with a volcano**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2011-Level-1-Ru-aumoko-Rages/Living-with-a-Volcano)While dangerous, volcanoes can also benefit people and the land.

[**Rūaumoko Rages**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2011-Level-1-Ru-aumoko-Rages/Ruaumoko-Rages) How volcanoes are formed, introduces the various kinds of volcanoes, and outlines features of New Zealand’s volcanic landscape.

[**Taupō**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2011-Level-1-Ru-aumoko-Rages/Taupo) What the evidence tells us about the huge volcanic explosion that formed Lake Taupō and its effects on the landscape.

[**Time Capsules**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2011-Level-1-Ru-aumoko-Rages/Time-Capsules) The remains of Pompeii and Herculaneum, destroyed by a volcanic eruption, show people what life was like in these cities 2000 years ago.

**Level 2: Structure**

The focus in this issue of Connected is on the Nature of Science strand of the curriculum.

[**Building a wharenui**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2011-Level-2-Structure/Building-a-Wharenui)What materials and building techniques are used and what is the symbolism and spiritual significance of the wharenui.

[**More than a box**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2011-Level-2-Structure/More-than-a-Box) Planning, designing, and building a large indoor sports centre

[**Saffron’s Skeleton**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2011-Level-2-Structure/Saffron-s-Skeleton)Osteologist George shows the processes he uses to clean and preserve the bones of a chicken to help us understand skeletons and their evolution.

**Level 3: Border Security**

The focus in this issue of Connected is on the Nature of Science strand of the curriculum.

[**A Helpful Immigrant**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2011-Level-3-Border-Security/A-Helpful-Immigrant)Bio-control agents are organisms imported to manage pests. Careful research is needed beforehand and constant monitoring while in use.

[**It seemed Like a Good Idea at the Time**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2011-Level-3-Border-Security/It-Seemed-Like-a-Good-Idea-at-the-Time)The introduction of ferrets, stoats, and weasels to get rid of rabbits caused unforeseen destruction on our native animals.

[**Protecting the Border**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2011-Level-3-Border-Security/Protecting-the-Border) Technologies we use to prevent unwanted pests, diseases, and goods coming into NZ and to prevent precious taonga being smuggled out.

[What is Biosecurity?](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2011-Level-3-Border-Security/What-is-Biosecurity)  As a group of isolated islands, NZ developed a unique range of ecosystems. These need to be protected from the disastrous impacts of plants or animals from other countries.

Connected 2012

The focus in this issue of Connected is on the Nature of Science strand of the curriculum.

**Level 2: The buzz of bees**

[**Home Sweet Comb**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-2-The-Buzz-of-Bees/Home-Sweet-Comb) People living in different cultures and at different times made beehives in different ways.

[**Healing Honey**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-2-The-Buzz-of-Bees/Healing-Honey) Mānuka honey’s special healing properties that make it valuable for medicinal purposes e.g. honey bandages used to treat wounds.

[**Bees are Very Important Pollinators**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-2-The-Buzz-of-Bees/Bees-are-VIPs-Very-Important-Pollinators)The honey bee and flowering plants help each other - while gathering nectar and pollen, the bee helps to pollinate flowers.

[**Staying alive**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-2-The-Buzz-of-Bees/Staying-Alive) Honey bee survival is threatened by the behaviours of other living things, including humans.

**Level 3: Watching the weather**

****[**What Makes the Weather**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-3-Watching-the-Weather/What-Makes-the-Weather)The water cycle and changes in air pressure and temperature . work together to cause a variety of weather conditions.

[**New Zealand’s Weather**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-3-Watching-the-Weather/New-Zealand-s-Weather) Oceans, continents, and icecaps affect the way air moves, heats, and cools as it produces the weather in NZ.

[**Greg’s Pointed Problem**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-3-Watching-the-Weather/Greig-s-Pointed-Problem) The technology of making umbrellas.

[**Magic in the Wind**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-3-Watching-the-Weather/Magic-in-the-Wind) some of the technological challenges faced by Len Lye in designing a successful wind wand.

[**Why Does it Always Rain on Me?**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-3-Watching-the-Weather/Why-Does-It-Always-Rain-on-Me) Time-series data are explored to find patterns in rainfall.

**Level 4: Oceans a source of life**

[**Voyage of Exploration**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-4-Oceans-A-Source-of-Life/Voyage-of-Exploration)The marine diversity in New Zealand’s territorial waters and the process that NIWA scientists use to classify organisms.



[**Catch my Drift**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-4-Oceans-A-Source-of-Life/Catch-My-Drift) Phytoplankton are the key producers in the ocean – they make food and oxygen that consumers depend on and are important in the carbon cycle.

[**Who’s Eating Who**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-4-Oceans-A-Source-of-Life/Who-s-Eating-Who) Creatures in the Antarctic food web have adaptations that enable them to survive in the harsh Antarctic environment.

[**Taking the Bait**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-4-Oceans-A-Source-of-Life/Taking-the-Bait) The underwater bait setter is designed to reduce the number of seabirds harmed through long-line fishing.

[**Skin and Bones**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-4-Oceans-A-Source-of-Life/Skin-and-Bones) The fascinating communities that develop in the carcasses of whales on the ocean floor.

[**Spying on Starfish**](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2012-Level-4-Oceans-A-Source-of-Life/Spying-on-Starfish) Dr Miles Lamare tested a new tagging technique that could be used on sea stars, a challenging exercise..

Connected 2013

The focus of *Connected* this year is on the science capability: gather and interpret data

**Level 2: I spy.** Item no.40667

**[Take a Closer Look](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-2-I-Spy/Take-a-Closer-Look)** Scientists are detectives who try to solve the mysteries of nature, using their senses to find out what life, the world & the universe are up to.



[**What Alice Saw**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-2-I-Spy/What-Alice-Saw) In 1880, when Alice McKenzie was 7 years old, she saw a large, blue bird. She thought the bird was a takahē. What if it wasn’t?

[**Giving the Ocean a Voice**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-2-I-Spy/Giving-the-Ocean-a-Voice) How is the health of the Pacific Ocean? The crews of seven voyaging canoes have been finding out. What did they observe?

[**The Takeaway Table**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-2-I-Spy/The-Takeaway-Table) Room 3 has its own bird “takeaway table”, stocked with delicious bird food. They study & report on visits from different bird species.

[**Look out for Monarchs**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-2-I-Spy/Look-out-for-Monarchs) In NZ, scientists are gathering data about monarch butterflies. They want to find out where the butterflies fly to and from – and where they go in winter.

**Level 3: Food for Thought** Item no. 40669

**[Why Is the Moon Upside Down?](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-3-Food-for-Thought/Why-Is-the-Moon-Upside-Down)** The Moon looks weird up here. There’s something wrong with it.



[**A New Zealand Crocodile?**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-3-Food-for-Thought/A-New-Zealand-Crocodile) Scientists digging in Southland soil in 1989 found something that would change our ideas about animals that have lived in Aotearoa.

[**Fast Rust**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-3-Food-for-Thought/Fast-Rust) What doesn’t breathe but can’t live without air, doesn’t drink but needs water near, never sleeps & won’t rest much, is stronger than steel, but crumbles at a touch?

[**You Can Count on It**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-3-Food-for-Thought/You-Can-Count-on-It) Fa‘aea’s mum, a meteorologist, talked to Fa‘aea’s class about sorting & displaying data in different ways.

[**The Fish Highway**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-3-Food-for-Thought/The-Fish-Highway) There is a maze of water & sewage pipes under Wellington’s pavements, beneath manhole covers & bundles of cables. The oldest pipes are lined with bricks. They snake under the streets.

**Level 4: Are you sure?** Item no. 40671

**[After the Spill](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-4-Are-You-Sure/After-the-Spill)** If an oil spill occurred on your local beach, how would it affect you now and in the future?

[**An Ecologist on Ice**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-4-Are-You-Sure/An-Ecologist-on-Ice) An interview with ecologist Phil Lyver about Adelie penguin population dynamics and the marine ecosystem in the Ross Sea.

[**Gather Your Data**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-4-Are-You-Sure/Gather-Your-Data) In the past, ecologists wished there was an easy way to record data in difficult alpine environments. Now ecologists use data loggers.



[**Accidental Plastics**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-4-Are-You-Sure/Accidental-Plastics) From your toothbrush to your television, plastic products are just everywhere. It’s difficult to imagine life without these synthetic compounds.

[**Keep Your Cat Inside**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2013-level-4-Are-You-Sure/Keep-Your-Cat-Inside) We had a cat once that killed rats, mice, a stoat, skinks, wētā, & birds (I saw them!). Perhaps pet cats should be kept inside.

Connected 2014

The focus of *Connected* this year is on the science capability: use evidence to support ideas

**Level 2: How do you know?** Item no.43957

**[Garden with Science](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-2-How-Do-You-Know/Garden-with-Science)** To grow healthy plants, gardeners use scientific knowledge and skills, including observing the world around them and experimenting to find evidence to support their ideas.



[**Super Senses**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-2-How-Do-You-Know/Super-Senses) Scientists gather & use evidence about animals’ super navigational senses to support their ideas.

[**Winning the Bledisloe Cup**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-2-How-Do-You-Know/Winning-the-Bledisloe-Cup) Two market gardeners use science to develop innovations that have changed the ways veges are grown in NZ.

[**Pop! Froth! Fizz!**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-2-How-Do-You-Know/Pop%21-Froth%21-Fizz) A class makes predictions, observes what happens & suggests a possible explanation for acid-carbonate reactions.

[**Making Amazing Places**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-2-How-Do-You-Know/Making-Amazing-Places) A group of year 4 Christchurch students designed the winning playground by gathering survey data and research evidence about the popularity of their idea.

[**The Cardboard Cathedral**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-2-How-Do-You-Know/The-Cardboard-Cathedral) During the Christchurch earthquake, the cathedral was so badly damaged it couldn’t be used. Therefore, the people in charge of the cathedral worked with architects, engineers, and builders to build an innovative new temporary cathedral.

**Level 3: Rising seas** Item no**.** 43967

**[Rising Seas](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-3-Why-Is-That/Rising-Seas)** We know that global warming is raising sea levels, but the rate of change & its likely impact are unclear. Scientists investigate what is happening & use evidence to suggest how we might adapt to the changes.



[**Counting Kākahi**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-3-Why-Is-That/Counting-Kakahi) Scientist Hannah Rainforth investigated kākahi in the Whanganui River to find whether the evidence supports claims by local kaumātua that kākahi have nearly disappeared.

[**Rebuilding Christchurch with Amazing Ideas**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-3-Why-Is-That/Rebuilding-Christchurch-with-Amazing-Ideas) Christchurch students design an amazing place, testing their ideas & using evidence to show that the ideas could really work.

[**Elephant Toothpaste**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-3-Why-Is-That/Elephant-Toothpaste) The zoo asks students to invent a recipe for elephant toothpaste. Are they successful? And what do the elephants think of their new toothpaste?

[**The Tsunami That Washed Time Away**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-3-Why-Is-That/The-Tsunami-That-Washed-Time-Away) Geologists James Goff & Scott Nichol think the landscape at Henderson Bay was changed by a huge tsunami hundreds of years ago. Can they find evidence of this?

**Level 4: What’s the evidence?** Item no. 43977

**[Beating the Wind](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-4-What-s-the-Evidence/Beating-the-Wind)** Scientist Lindsey Underwood uses evidence to explain how aerodynamics can improve the performance of racing cyclists.



[**The Great Marble Challenge**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-4-What-s-the-Evidence/The-Great-Marble-Challenge) A class is challenged to design a ramp that will get a marble to stop 500 mm - 2 m from the end of the ramp.

[**Training for Success**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-4-What-s-the-Evidence/Training-for-Success) Top athlete Phoebe Edwards and her coach, Mike Ritchie, constantly observe and measure her performance and work on improving technique, to help her train for success.

[**Learning from the Christchurch Earthquakes**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-4-What-s-the-Evidence/Learning-from-the-Christchurch-Earthquakes) New learning has come out of the devastation of the Christchurch earthquakes. How has data & research from the earthquakes changed what geologists think?

[**Black is Back**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2014-level-4-What-s-the-Evidence/Black-is-Back) Te Papa conservator Rangi Te Kanawa uses her knowledge of traditional dyeing practices & science to preserve fibres in textiles that have been dyed using iron-tannate black dyes.

Connected 2015

The focus of *Connected* this year is on the science capability: critique evidence

**Level 2: have You checked?** Item no 16393

**[Why Do Our Muscles Get Tired?](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-Level-2-Have-You-Checked/Why-Do-Our-Muscles-Get-Tired)**  Moana & Oscar carry out a simple investigation to discover more about muscle fatigue (muscles using oxygen faster than our body can supply it)



[**Operation Duck Pond**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-Level-2-Have-You-Checked/Operation-Duck-Pond) Nathan Burkepile, a scientist who wants to know what kind of pond ducks like best, works with the citizen scientists to make sure that the data they collect is reliable.

[**Learning from the Tangata Whenua**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-Level-2-Have-You-Checked/Learning-from-the-Tangata-Whenua) As a scientist, James Ataria thinks carefully about how evidence should be collected and critiqued. But, unlike many other scientists, he also uses Māori cultural knowledge to help his work.

[**Heat It Up**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-Level-2-Have-You-Checked/Heat-It-Up) Students design an experiment to test whether their solar oven would work better if they paint it black on the inside. They change their design to improve the quality & reliability of their data.

**Level 3: Fact or Fiction?** Item no 16421

**[Pseudoscience](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-level-3-Fact-or-Fiction/Pseudoscience)** Advertisements can mislead by using pseudoscience (pseudoscience sounds scientific but is not based on solid evidence). We need to think like scientists to be able to tell the difference between real science & pseudoscience, We can use our knowledge of what makes an investigation scientific to ask whether the info is trustworthy.



[**Sleep Sleuths**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-level-3-Fact-or-Fiction/Sleep-Sleuths) Jeremy & Marama investigate to find out how much sleep their classmates are getting. They discover that sometimes, a good investigation can raise more questions than it answers!

[**Catching a Space Duck**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-level-3-Fact-or-Fiction/Catching-a-Space-Duck) After 10 years flight the spacecraft Rosetta caught up with Comet 67P and sent a lander down to its surface. Scientists use the info sent back to find out more about our solar system.

[**The Science of Rongoā**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-level-3-Fact-or-Fiction/The-Science-of-Rongoa) Māori use kawakawa as rongoā (traditional medicine). But when scientists tested the kawakawa leaves they said there was no scientific evidence to support the plant’s medicinal properties. Chris Ryan took a closer look at the scientists’ investigations and noticed that they had not used traditional methods to prepare the kawakawa. He wondered if this might have affected their results. So Chris decided to carry out his own investigation.

**Level 4: Is that so?** Item no16407

**[Reconnecting the Brain](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-level-4-Is-That-So/Reconnecting-the-Brain)** Dr Melanie Cheung, a neurobiologist, studies the roro (brain), collecting and analysing data about how it works and what can go wrong. She also studies the use of tikanga (Māori customary practices) in the modern science world.



[**Lighting the Way with Solar Energy**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-level-4-Is-That-So/Lighting-the-Way-with-Solar-Energy) Tokelau decided to switch to renewable energy. After thinking critically about all the options. They decided that solar energy was the best option suited to their sunny climate.

[**A Sinking Feeling**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-level-4-Is-That-So/A-Sinking-Feeling) Mr Tuala’s class learn about density (and how it relates to floating a boat), critique and improve their original boat design.

[**Don’t Sit If You Want to Keep Fit**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2015-level-4-Is-That-So/Don-t-Sit-If-You-Want-to-Keep-Fit) Scientific evidence suggests that sitting for long periods of time can cause health problems and that standing and moving around is better for us. But as with any scientific evidence, we need to ask questions about the evidence to determine if it can be trusted.

Connected 2016

The focus of *Connected* this year is on the science capability: interpret representations

**Level 2: Show and tell.** Item no 1672?

**An Invasion of Yellow Crazies.** The islands of Tokelau have been invaded by yellow crazy ants. Scientists are investigating where they are & what can be done about them. By collecting and recording data, they can identify the extent of the problem and figure out the best course of action.



**What’s Inside?** The vets at Wellington zoo encounter a lot of interesting patients. Luckily, they have a range of amazing technologies that harness light and sound to help them see inside sick and injured animals.

[**Sun, Wind or Rain?**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2016-Level-2-Show-and-Tell/Sun-Wind-or-Rain) People in Aotearoa NZ have been predicting the weather for years. From violent storms to warm breezes, by observing patterns in nature people can tell what tomorrow will bring.

**I Am Alice** Alice is a tunnel-boring machine used to build two tunnels for Auckland’s Western Ring motorway. Hear about the experience from Alice herself as she provides a first person account of the impact of new technology on our land and infrastructures.

**Level 3: Picture this** Item no. 16735

**[Totally Random?](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2016-Level-3-Picture-This/Totally-Random)** Miranda is going to explode if Hugh rolls another six. Three in a row just isn’t fair. Isn’t rolling a dice meant to be random? Take a deeper look into the mathematical concept of randomness and find out if Miranda stands a chance against Hugh.



[**Blood Sugar**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2016-Level-3-Picture-This/Blood-Sugar) Sarah Cook is a busy year 10 student living with type 1 diabetes. Find out what Sarah does to manage her diabetes and make sure it doesn’t prevent her full and active lifestyle.

[**Over the Rainbow**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2016-Level-3-Picture-This/Over-the-Rainbow) Ms Maxwell’s students must use their prior knowledge of the electromagnetic spectrum on a treasure hunt to find out how different types of energy can be used in their everyday lives.

[**On the Move**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2016-Level-3-Picture-This/On-the-Move) Some animals migrate thousands of kilometres every year - so how do scientists keep track of them? Take a look at the different technologies scientists use to study migration patterns, and discover what they have learnt about great migrations.

**Level 4: Getting the Message.** Item no 16749

**Winning Ways: Presenting Scientific Data** Grace is on a mission to win the science fair – but to do so she must structure & present her investigation in the most informative and thought-provoking way possible. Grace uses diagrams, photographs, tables, graphs, info-graphics & clear science writing to present her data & blow the judges away!



[**Driving Us into the Future**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2016-Level-4-Getting-the-Message/Driving-Us-into-the-Future) Electric cars are often seen as the vehicles of the future – but are they? Read about the development of electric cars & see how the technology they use contrasts with that used by fuel-powered cars.

[**Can You Hear That?**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2016-Level-4-Getting-the-Message/Can-You-Hear-That) Sounds are all around us, even if we can’t hear them. Human ears are designed to pick up sound waves of a range of different frequencies, but ultrasonic and infrasonic sounds have frequencies that only certain animals can hear.

[**What Now for the Rena?**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2016-Level-4-Getting-the-Message/What-Now-for-the-Rena) In 2011 MV Rena struck Astolabe Reef causing an environmental disaster. The clean-up operation has removed lots of debris from the wreck – but large parts Rena still remain on the ocean floor. What factors were considered when making the decision on the future of the Rena wreck?

Connected 2017

The focus of *Connected* this year is on the science capability: engage with science

**Level 2: Taking Action.** Item no. 69103

**[Space Food](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2017-Level-2-Taking-Action/Space-Food)** A group of students investigate how to stop food rotting on a journey to Mars. They share what they know about the different methods of food preservation to come up with a plan.



[**Gardening in the Living Room**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2017-Level-2-Taking-Action/Gardening-in-the-Living-Room) Balaclava School has a new greenhouse called the Living Room. The students find out how the environment inside the Living Room helps plants grow during the cold Dunedin winters and investigate which vegetables grow best inside and outside its unique climate.

**Down the Drain** Students at Wilford School in Petone were shocked to discover the amount of rubbish finding its way onto their local beach. Find out how they investigated the issue by using traps to collect the rubbish entering the stormwater system.

**Bringing Back the Birdsong** For years, introduced predators have been killing birds along the Kepler Track in Fiordland. Students in the Kids Restore the Kepler project are working with the Department of Conservation and the Fiordland Conservation Trust to reduce the number of predators living in the area. Their mission: to bring birdsong back to the Kepler.

**Level 3: Mahi Tahi.** Item no 69118

[**Testing the Waters**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2017-Level-3-Mahi-Tahi/Testing-the-Waters)  How clean is the water in your river? Scientists are testing the health of the Maitai River. Find out what data they collect and what can be done to make our rivers cleaner and healthier for everyone.



[**Pet Power**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2017-Level-3-Mahi-Tahi/Pet-Power)Humans and animals have a powerful bond. Some people think that this bond could have a positive effect on human health and behaviour. But what does the science say? Investigate the evidence for yourself.

[**Captured** in **Ice**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2017-Level-3-Mahi-Tahi/Captured-in-Ice)  Nancy Bertler is a scientist who studies the ice. She’s been examining Antarctic ice cores to discover what Earth’s climate was like in the past – and how it might change in the future

[**Building for the Future**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2017-Level-3-Mahi-Tahi/Building-for-the-Future)  The Samoan village of Sa’anapu is under threat from tsunamis, cyclones, and rising sea levels. To protect their village, the Council of Matai are working with an architect and scientist from NZ. Together, they’re drawing on cultural, scientific, and technological knowledge to build a safer future for Sa’anapu.

**Level 4: Where to next?** Item no. 69132

[**Sensing Data**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2017-Level-4-Where-to-Next/Sensing-Data)  Air pollution is a problem in many cities, including Christ-church. After the 2011 earthquake, a team of researchers used technology & big data to help make Christchurch a healthier, smarter city to live in.



**Turning Old into New** Shoes made from chewing gum? Jackets made from drink bottles? Go beyond the recycling bins and find out how everyday objects and materials can be broken down and made into something new.

[**Kauri Dieback**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2017-Level-4-Where-to-Next/Kauri-Dieback) The future of our kauri forests is at risk from a disease called kauri dieback. Combating the spread of this threat requires expertise from both Western science and mātauranga Māori and calls on everyone to get involved.

[**Global Action**](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2017-Level-4-Where-to-Next/Global-Action) This detailed article looks at the science and politics of climate change. It examines what global warming is, explores how scientists use computer modelling to predict the impact of climate change & explains how scientific innovations in NZ could help reduce our agricultural emissions.

Connected 2018

The focus of *Connected* this year is on computational thinking for digital technologies and designing and developing digital outcomes. NS = not a science focus

**Level 2: Step by step**

### [Amazing Algorithms -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-2-Step-By-Step/Amazing-Algorithms) This article introduces & explains the concept of algorithms in a simple & engaging way, by providing concrete examples from everyday life, mathematics & computer programming. NS

### [The War on Weeds -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-2-Step-By-Step/The-War-on-Weeds) Students at Kaniere School are helping scientists combat the spread of weeds, using simple digital technology to identify the weeds & upload information to a national database.

### [Lighting the Sky with Raspberry Pi -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-2-Step-By-Step/Lighting-the-Sky-with-Raspberry-Pi) Students at Fernridge School have created a digital light display for Matariki using Raspberry Pi computers. This article shows how the students created the light display, providing a real-life context for exploring how computers work.

### [Animation Creations -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-2-Step-By-Step/Animation-Creations) Ryan Kothe, an animator from Auckland, uses stop-motion animation to make short videos and advertisements. In this article, he explains how to create your own stop-motion animation movie. NS

### Robot.

### Level 3: Cracking the Code

### [To Build a Bot -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-3-Cracking-the-Code/To-Build-a-Bot) 3 students designed and built a robot that won the New Zealand VEX IQ Challenge. An authentic introduction to programming and computational thinking (& physics & engineering concepts related to energy, weight, & balance).

[South Pacific Beats -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-3-Cracking-the-Code/South-Pacific-Beats) Designer Rachael Hall has developed a modern version of the traditional Tongan lali. Called Patō, Rachael’s drum keeps the traditional sound of a lali but incorporates digital capabilities.

### [Square Eyes -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-3-Cracking-the-Code/Square-Eyes) Siali is selected to trial a new augmented reality device called SquareEye but find it is affecting his experiences in ways he doesn’t necessarily consent to. NS

### [Listening to the Land -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-3-Cracking-the-Code/Listening-to-the-Land)  Pauline Harris, a scientist of Rongomaiwahine and Ngāti Kahungunu descent, is collecting and recording mātauranga from iwi and hapū about plants & animals in Aotearoa. The team is using a computer program to record the mātauranga and connect it to particular times and places in history. They hope this info will help us understand how climate change is affecting Aotearoa’s wildlife.

### Rocket about to launch.Level 4: Digital Space

### [Emotional Robots -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-4-Digital-Space/Emotional-Robots) Consider the development of artificial intelligence (AI) from a social & ethical perspective: the ethical implications of building AI that act like humans, and what would happen if AI became more intelligent than us. NS

### [Saving the World, One Swipe at a Time -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-4-Digital-Space/Saving-the-World-One-Swipe-at-a-Time) This article describes how 3 Kiwi companies have used digital technology to help solve health or social problems. NS

[Kiwis in Space -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-4-Digital-Space/Kiwis-in-Space) In January 2018, NZ became one of only 11 countries that have successfully built and launched a rocket capable of sending satellites into space. This interview with Rocket Lab Avionics Manager Naomi Altman explains the science and technology behind that incredible achievement.

[Under the Sea –](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2018-Level-4-Digital-Space/Under-the-Sea) High school students partnered with scientists, fishers & local iwi to survey a rocky reef 11 km off the Taranaki coast. The article focuses on the survey methods being used and the different technologies involved in each method.

**Connected 2019**

NS = not a science focus

**Level 2: Wild Discoveries**

[Animal X Factor](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-2-Wild-Discoveries/Animal-X-Factor):  All of us have favourite animals – but why do we like some animals more than others?

[Kimihia Kermit](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-2-Wild-Discoveries/Kimihia-Kermit): Students from the Ngāti Mutunga rohe have been listening out for frogs. They want to find out which frogs, and how many of them, are living in this north Taranaki area.

[Sea Science](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-2-Wild-Discoveries/Kimihia-Kermit): In 2017, students on Aotea Great Barrier Island became scientists and did something about the rubbish washing up on their shore and learnt about marine debris.

[The House that Dan Built](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-2-Wild-Discoveries/Kimihia-Kermit): Eco-houses are designed to look after the natural world. Daniel Turinsky,from Nelson Central School entered a competition to design an eco-house using the computer game Minecraft.



**Level 3: Shifting views**

[Three Drones -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-3-Shifting-Views/Three-Drones) Three examples of drones to show how they work, how they are used now, and how they might be used in the future

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### [Betty Batham: Biologist -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-3-Shifting-Views/Betty-Batham-Biologist) The story of Betty Batham, a pioneering marine biologist. Born in an era when a woman’s place in society was largely limited to the home, Betty rose to become a noted scientist.

[Predicting Possibilities -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-3-Shifting-Views/Predicting-Possibilities) Mathematics can be used to predict the possible outcomes of a range of human and environmental activities. Mathematical models are created by defining and measuring key variables, designing an equation that shows how the variables interact, and using the equation to make predictions. NS

### [The Long Pause –](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-3-Shifting-Views/The-Long-Pause) Archaeologists find evidence to explain the mystery of the long pause between 2 major periods of Pacific migration.



**Level 4: Seeing Beyond**

[Fake Facts](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-4-Seeing-Beyond/Fake-Facts) - Digital technology exposes us to information that can be false or can do harm. How do we look at information critically and evaluate what is based on facts and worth sharing. NS

[Maths Craft -](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-4-Seeing-Beyond/Maths-Craft) This article takes a playful, creative approach to pure mathematics, exploring craft activities that let students explore the properties of Möbius strips & mathematical knots. NS

[Defending the Dark](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-4-Seeing-Beyond/Defending-the-Dark) – How the science of astronomy is impacted by the issue of light pollution and practical ways of reducing it

[Global Positioning system](http://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2019-Level-4-Seeing-Beyond/The-Global-Positioning-System) – How GPS works, its benefits, and the risks of over-reliance.

**Connected 2020**

**Level 2: Digging Deeper**

[Squawkzilla](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-2-Digging-Deeper/Squawkzilla) – the story of the discovery of a giant parrot that lived in NZ 19 million years ago, showing how scientists work to figure out life used to look like millions of years ago.

[City of Bugs](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-2-Digging-Deeper/City-of-Bugs) - A science project conducted by students in three schools. investigating which inner city ecosystem supports the most insects and invertebrates.

[Whakaotirangi & her Kete of Kumara](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-2-Digging-Deeper/Whakaotirangi-and-her-Kete-of-Kumara) – The story of how Tainui’s ancestor, Whakaotirangi, brought kūmara and other plants to Aotearoa and describes the techniques she used to plant, grow, and store them.

[Making Scents](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-2-Digging-Deeper/Making-Scents) – A class project where students found out how smell gets into a scented candle. They learned about distillation, states of matter, and what it takes to become scientists.

**Level 3: Kaitiakitanga**

[Te Tapa Ingoa](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-3-Kaitiakitanga/Te-Tapa-Ingoa) - Naming and grouping plants and animals from a Māori worldview using the framework provided by whakapapa.

[Trees, Seas & Soil](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-3-Kaitiakitanga/Trees-Seas-and-Soil) - Processes of the carbon cycle and their impact on climate.

[Ra’ui: Giving it back to the Gods](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-3-Kaitiakitanga/Ra-ui-Giving-It-Back-to-the-Gods) – Exploring a scientific issue from a Pacific worldview - managing marine resources with the tradition of ra‘ui.

[Life in Aotearoa New Zealand](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-3-Kaitiakitanga/Life-in-Aotearoa-New-Zealand) - The evolutionary development of life in Aotearoa New Zealand exploring concepts of evolution, adaptation and geological change.

**Level 4: Feeling the Heat**

[Wildfire](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-4-Feeling-the-Heat/Wildfire) – What are wildfires, what causes them, how do they affect us, and how are they affected by climate.

[Pā Tūwatawata](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-4-Feeling-the-Heat/Pa-Tuwatawata-and-the-New-Zealand-Wars) & the NZ wars – a technology focus on pās. NS

[Foulden Maar: Fossils or Food](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-4-Feeling-the-Heat/Foulden-Maar-Fossils-or-Food) – Fossilisation and the formation of Foulden Maar and the commercial interests competing for its survival.

[Fostering Felines](https://instructionalseries.tki.org.nz/Instructional-Series/Connected/Connected-2020-Level-4-Feeling-the-Heat/Fostering-Felines) – students design a technological device to deal with an issue about caring for the thousands of newborn kittens handed in to SPCA each year. NS

From 2021 on the Connecteds have a NZ history focus